

Maybe your appendix does serve a purpose

By Colin Barras ScienceNOW

The appendix may not be useless after all. The worm-shaped structure found near the junction of the small and large intestines evolved 32 times among mammals, according to a new study. The finding adds weight to the idea that the appendix helps protect our beneficial gut bacteria when a serious infection strikes.

It's been clear for about a century that the structure contains a particular type of tissue belonging to the lymphatic system. This system carries the white blood cells that help fight infections. Within the last decade, research has shown that this lymphatic tissue encourages the growth of some kinds of beneficial gut bacteria. What's more, careful anatomical study of other mammals has revealed that species as diverse as beavers, koalas and porcupines also have a structure jutting off of their guts in exactly the same place as our appendix – in other words, the feature is much more common among mammals than once thought.

Now, an international team of researchers that includes William Parker, a surgeon who studies the immune system at Duke University Medical Center in Durham, says it has the strongest evidence yet that the appendix serves a purpose. In a new study, published online this month in *Comptes Rendus Palevol*, the researchers compiled information on the diets of 36 living mammals, including 50 species now considered to have an appendix, and plotted the data on a mammalian evolutionary tree. They found that the 50 species are scattered so widely across the tree that the structure must have evolved independently at least 32 times, and perhaps as many as 38 times.

By plotting the dietary information onto the evolutionary tree, the researchers could work out whether the appendix appears when a particular group of mammals changes its diet. In most cases, there was no sign of a dietary shift, suggesting appendix evolution doesn't necessarily proceed as Darwin thought. He may have correctly identified the origin of the ape appendix, though, which the analysis confirms did appear when our ancestors switched diets.

The study suggests the appendix performs a useful function, and the hurt is now on to identify what that function is.

The research team may already have the answer. In 2007, Parker and his colleagues suggested that the appendix has an immunological role, acting as a "safe house" for beneficial gut bacteria. These bacteria help train the immune system and can prevent diseases by outcompeting dangerous pathogenic bacteria – but there are times when the dangerous microbes gain the upper hand and overrun the gut. The researchers reasoned that when this happens, the beneficial bacteria could retreat to the safety of the appendix, which remains unaffected. Once the immune system has beaten the infection, the beneficial bacteria emerge from the appendix to quickly re-colonize the gut.

The "safe house" idea makes sense, says Indi Trehan, a pediatrician at the Institute for Public Health at Washington University in St. Louis who recently studied the importance of maintaining gut bacteria when treating people with malnutrition. "The appendix has a unique anatomical location that is out of the way," he said. "Bacteria can be kept safe there for repopulation as needed."



Parker

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CCSS: reading informational text

4. Which best describes the understanding of the exact function of the appendix?

- A determined
- B identified
- C supposed
- D unclear

5. If the appendix keeps beneficial gut bacteria safe during an infection, what happens when the body has fought off the infection?

- A The bacteria return to the gut.
- B The bacteria pass through the body.
- C The bacteria remain in the appendix.
- D The bacteria move to the long bones

1. In the past, the appendix was presumed to be an unnecessary part of the human body. How has that understanding changed?

A Today some scientists believe the appendix has a purpose.

B Today some scientists believe the appendix has no purpose.

C Today some surgeons refuse to remove an infected appendix.

D Today some surgeons refuse to believe the appendix is a part of the large intestine.

2. Which is most like the role the appendix plays in the human body, according to Dr. William Parker?

- A a bank that changes sugar into starch
- B a bank that changes blood into oxygen
- C a bank in which to store red blood cells
- D a bank in which to store helpful bacteria

3. Examine the headline. Which word suggests that the exact role of the appendix remains uncertain?

- A maybe
- B does
- C serve
- D purpose